

**A LINKAGE BETWEEN ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT. A  
MODEL DEVELOPMENT**

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**Abstract**

Previous researchers have suggested building a supportive knowledge management culture to support knowledge sharing and creation. Although many studies have been conducted in this area, few have investigated the influence of specific dimensions of organizational culture, namely innovation and team orientation on knowledge sharing and creation. Therefore, the purpose of this study is to investigate these relationships. Questionnaires were sent to 327 manufacturing firms in Johor that are listed in the Federation of Malaysian Manufacturers directory. Fifty eight usable returned questionnaires were received and analyzed using correlation and multiple regression. The results of the study supported the proposition that team orientation has a significant influence on knowledge sharing and creation, while the relationship between innovation orientation and knowledge sharing and creation was not supported. Practical implications were discussed.

**Keywords:**

Knowledge sharing, knowledge creation, organizational culture

### **Abstrak**

Penyelidik sebelum ini telah mencadangkan pembinaan budaya pengurusan pengetahuan yang kondusif untuk menyokong perkongsian dan penciptaan pengetahuan. Walaupun banyak kajian telah dijalankan dalam bidang ini, kajian yang mengkaji pengaruh spesifik dimensi budaya organisasi, iaitu inovasi dan orientasi pasukan ke atas perkongsian dan penciptaan pengetahuan adalah terhad. Oleh itu, tujuan kajian ini adalah untuk mengkaji hubungan ini. Soal selidik telah dihantar kepada 327 firma pembuatan di Johor yang disenaraikan di Direktori Persekutuan Pengilang-Pengilang Malaysia. Lima puluh lapan soal selidik yang lengkap telah diterima dan dianalisis dengan menggunakan kaedah korelasi dan regresi berganda. Keputusan kajian ini menyokong hipotesis bahawa orientasi pasukan mempunyai pengaruh yang signifikan ke atas perkongsian dan penciptaan pengetahuan, manakala hubungan antara orientasi inovasi dan perkongsian dan pengetahuan tidak disokong. Implikasi praktikal dibincangkan.

### **Katakunci:**

Perkongsian pengetahuan, penciptaan pengetahuan, budaya organisasi

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## **Chapter 1**

### **Introduction**

Knowledge management (KM) is recognized today as one of the most important factors for the success of every business activity. This importance was felt by the organizations as they saw some considerable benefits from it and started to synchronize their core business strategies accordingly (Apostolou and Mentzas, 1999). According to Alavi and Leidner (1999), KM has long been practiced by the organizations in terms of activities such as discovering, storing, sharing and applying knowledge to improve productivity.

Knowledge has been identified as the last sustainable competitive advantage, hence signifying the importance of managing it. KM has shown beneficial in multiple aspects including raising employee satisfaction, higher organizational learning and improved return on investment (Davenport and Prusak, 1998; De Long and Fahey, 2000; Sherif and Xing, 2006).

KM can generally be defined as the process of capturing, storing, and applying knowledge. Bergeron (2003), looking at KM from the business perspective, defined it as “a deliberate, systematic business optimization strategy that selects, distills, stores, organizes, packages, and communicates information essential to the business of a company in a manner that improves employee performance and corporate competitiveness”.

Two of the main KM processes are knowledge creation (KC) and knowledge sharing (KS). According to Ipe (2003), KS is the process of disseminating knowledge for an easy acquisition by other members within the organization. Bartol and Srivastava (2002) defined knowledge sharing as the act of sharing experience, image, knowledge and other important information in the organizations.

Knowledge creation in general is the process of capturing individuals’ knowledge and making it reusable. According to Nonaka and Takeuchi (1995), organizational knowledge creation is “the capability of a company as a whole to create new knowledge, disseminate it throughout the organization and embody it in products, services and systems”.

To realize the benefits projected by the organizations for knowledge management implementation, it needs mechanisms that systematically provide a platform that supports creating, distributing, discovering and application of knowledge using the appropriate technologies within a supportive organizational setting (Sherif and Xing, 2006). Such settings might be reflected in the organizational culture, which is defined as the set of rules, norms, values, assumptions, symbols and beliefs that employees within an organization share as members (Schein, 1985). This highlights the influence of organizational culture on KM practices.

A review of current literature shows that such an influence is less explored though needed. Therefore, the main purpose of this study is to investigate the relationship between organizational culture, specifically team orientation and innovation orientation and KS and KC as signifiers of KM.

### **Problem Background**

Nonaka (1994) has categorized knowledge into two types, namely explicit and tacit. Explicit knowledge is knowledge that is codified, formally documented and transmittable, and able to be shared and maintained using databases and IT facilities. Tacit knowledge, on the other hand, is mainly personal and context dependent, embedded in individuals' experience and character traits, and does not lend itself to formal communication and transmission means. Tacit knowledge, as its nature implies, is more difficult to capture and classify which necessitates better understanding of social context in which it is being created and shared.

Creating and sharing knowledge is considered as one of the key success factors in today's organizations (Nonaka, 1991; Grant, 1996; Nonaka and Takeuchi, 1995). It has been acknowledged that information technology facilitates knowledge sharing and creation in the organizations. However, the role of social networks is often more crucial. Information technology alone does not guarantee the success of KM efforts in the organizations. Thus, there is a need to inculcate a supportive culture that promotes KM practices.

In the current competitive business environment, organizations need to come up with innovative and creative products in order to gain a competitive advantage and even to

survive. Many companies nowadays are investing heavily into KM in order to realize such goals. However, some researchers have found that in spite of such efforts, organizations still encounter difficulties that either impede or reduce the effect of KM initiatives (Leidner et al, 2006). The reason might be that the core corporate culture of the organization does not support KM initiatives.

Socialization process has been identified to enhance knowledge sharing and creation. Organizational culture that advances socialization process among members of organizations, allow tacit knowledge that are captured at the individual level to be disseminated more effectively to other organizational members (Nonaka & Takeuchi, 1995). This socialization process can be further amplified through teamwork where employees would tend to share their knowledge, experiences and ideas with each other in the course of solving problems. On the KC side, innovative cultures provide open and free environments that allow knowledge to be created and flourished. Therefore, organizations need to provide a proper environment for individuals to create knowledge (Nonaka, 1994).

These notions prompted us to argue that knowledge can be duly created and shared successfully in organizations with a knowledge management supportive culture. Therefore, this research aims to investigate the influence of organizational culture specifically, innovation orientation and team orientation on tacit knowledge sharing and creation.

### **Problem Statement**

KM success is usually translated in terms of the ability of organizations to manage knowledge sharing and knowledge creation. The internal environment of the organization is considered a key factor for the success of KM initiatives. Many researchers have investigated the linkage between organizational culture and knowledge management. Researchers such as De Long and Fahey (2000), O'Dell and Grayson (1998) and Ruggles (1998) have found organizational culture as being a hindrance to the activities of knowledge management.

On the other hand, other researchers suggested that organizational culture can be tailored as to support KM initiatives and therefore be of positive effect to such efforts. A well-

constructed organizational culture i.e., motivating and encouraging self-actualization and risk taking, can promotes KM in an organization. A study conducted by Jarvenpaa and Staples (2001) concludes that an organization with a culture of higher communality tends to have a higher chance of creating and discovering new knowledge. Finally, a research conducted by Gold *et al.*, (2001) found that a supportive and motivated environment in an organization enhances the success of KM efforts.

Although many studies have raised the issue of organizational culture's influence on KM success, few have investigated empirically the influence of specific dimensions of organizational culture on tacit knowledge sharing and creation. Based on previous literature, we hypothesize that certain dimensions of organizational culture encourage the willingness among individuals to share tacit knowledge and in the process promote the creation of tacit knowledge. This research would be an initial attempt to link organizational culture and knowledge management, and the intention of this research is to propose a conceptual framework and test the model empirically.

### **Research Questions**

Addressing the issues of this study, the following questions are raised.

1. Is there a relationship between team orientation and knowledge creation?
2. Is there a relationship between innovation orientation and knowledge creation?
3. Is there a relationship between team orientation and knowledge sharing?
4. Is there a relationship between innovation orientation and knowledge creation?

### **Objectives**

Based on the research questions above, the main purpose of this study is to examine the relationship between organizational culture (i.e., team and innovation orientations) and tacit knowledge creation and sharing. The research objectives are:

1. To propose a model that links organizational culture (i.e., team and innovation orientations) and tacit knowledge creation and sharing
2. To test the proposed model empirically
3. To examine the theoretical and practical implications of the findings on knowledge management

### **Propositions**

Based on the extensive literature review, the following propositions are deduced. The propositions will be elaborately discussed in Chapter 2.

Proposition 1: Team orientation has a positive effect on tacit knowledge creation.

Proposition 2: Team orientation has a positive effect on tacit knowledge sharing.

Proposition 3: Innovation orientation has a positive effect on tacit knowledge creation.

Proposition 4: Innovation orientation has a positive effect on tacit knowledge sharing.

### **Scope of the study**

This study focuses on investigating the linkage between organizational culture (i.e., team and innovation dimension) and tacit knowledge creation and sharing. This research was conducted on the manufacturing firms in the state of Johor as listed in the directory of Federation of Malaysia Manufacturers. Respondents were technicians and/or engineers of those companies.

### **Significance of the study**

In today's economy, the role and value of knowledge as the last source of competitive advantage has been highlighted. Tacit knowledge, because of its subjective nature, is difficult to duplicate and copy and hence, it can be a better source of organizational

competitiveness. Previous studies have suggested the influence of the organizational culture on the success of KM initiatives. We feel that certain aspects of organizational culture can have a profound impact on creation and sharing of tacit knowledge and this study explores such impact. Therefore, the results of this study would help organizations developing strategies that would facilitate KC and KS through building organizational culture that leads to the success of KM initiatives.

In addition, this study will contribute to the body of knowledge by highlighting the main linkage between organizational culture (i.e., team and innovation orientations) and tacit knowledge creation and sharing and provide empirical evidences of the relationships.

### **Chapter Summary**

This chapter gives an overview of this study. It includes a brief introduction, the problem statement, the objectives, the research questions, the propositions, the scope of the study and its significance.

### **Report Organization**

This report is organized into five chapters. Chapter one presents an introduction and the background of the study, which is followed by the problem statement, scope of the study, objectives and propositions and the significance of the study. Chapter two focuses on reviewing previous literature related to this study. Chapter three focuses on the methodology, strategies and the instruments that are used in conducting this study. Chapter four focuses on the analyses and the interpretation of the findings. Chapter five summarizes the report and gives recommendations to the findings.

## **Chapter 2**

### **Literature Review**

#### **Introduction**

This chapter provides definitions and meanings of terms which are widely used in KS and KM as a whole. This chapter introduces concepts such as knowledge and types of it, KM, the main processes involve in KM, a brief discussion on KM systems and the benefits of KM implementation. In addition, discussion is made on tacit knowledge creation and sharing within the organization using the SECI model of Nonaka and Konno (1998). Furthermore a discussion is made on organizational culture represented by team orientation and innovation orientation and their implication related to knowledge sharing and creation. This chapter comes to an end, drawing the connection between the previous works and this research so as to hypothesize a theoretical model.

#### **Knowledge**

Knowledge is currently the highlighted banner of business headlines (Probst et al., 2000). According to Nonaka and Takeuchi (1995), knowledge can be defined as a justified true belief. Davenport and Prusak (1998) define knowledge as “a fluid mixed of framed experienced, values, contextual information and expert insight”. Tiwana (2002) defines knowledge as a deeper and expansive form of information which is put into action. This definition implies that information becomes knowledge when it is used for making decisions. Toffler and Toffler (1995) argue that humans do not manage knowledge but instead their decisions and actions are controlled by it. Knowledge is considered valuable information obtained from experience, exchange and suppositions (Zack, 1999).

Knowledge, information and data are sometimes defined interchangeably. Becerra-Fernandez *et al.* (2004) highlight the distinctions between these definitions. Data is a raw truth, facts and figures that has no meaning. Data denotes as crude resource since it bears

no meaning. On the other hand, information is referred to as a processed data with meaning. According to Nonaka (1994), information is stream of messages which generate knowledge. Information can be considered as data that has meaning, intuition and can be manipulated to make decisions. According to Becerra-Fernandez *et al.* (2004) knowledge is considered to be the deepest and richest among these three concepts.

### **Types of knowledge**

Tacit and explicit knowledge is the most prevalent taxonomy of knowledge (Nonaka and Takeuchi, 1995; Tiwana, 2002; Davenport and Prusak, 1998; Polanyi, 1964). Explicit knowledge is the type of knowledge that is easily understood, and can be manipulated (Nonaka and Takeuchi, 1995). Explicit knowledge involves facts, rules, and policies that can be captured and identified without further deliberations (Wyatt, 2001). Normally, explicit knowledge is knowledge that is expressed on a given media. Assessing explicit knowledge is surmountable.

By contrast, tacit knowledge is very difficult to codify and transfer (Nonaka and Takeuchi, 1995). According to Ipe (1993), sharing tacit knowledge is more difficult than sharing explicit knowledge. Tacit knowledge is basically transferred through face-to-face deliberations because it can only be identified within the mind and thoughts of individuals (Nonaka and Takeuchi, 1995). However, scientific techniques have recently been helpful in converting certain tacit knowledge into explicit knowledge (Wyatt, 2001). The conversion of tacit knowledge into explicit knowledge is an important mechanism that enhances organizational productivity as employees' past experiences and knowledge is documented and reused for the benefit of the organization.

### **Knowledge Management**

Review of literature reveals that, knowledge management has diverse definitions. According to Bhatt (1998), knowledge management is the process of building, distributing, presenting and applying knowledge. Holm (2001) defined knowledge management as the process of disseminating information to the right people at the right time and making good use of the



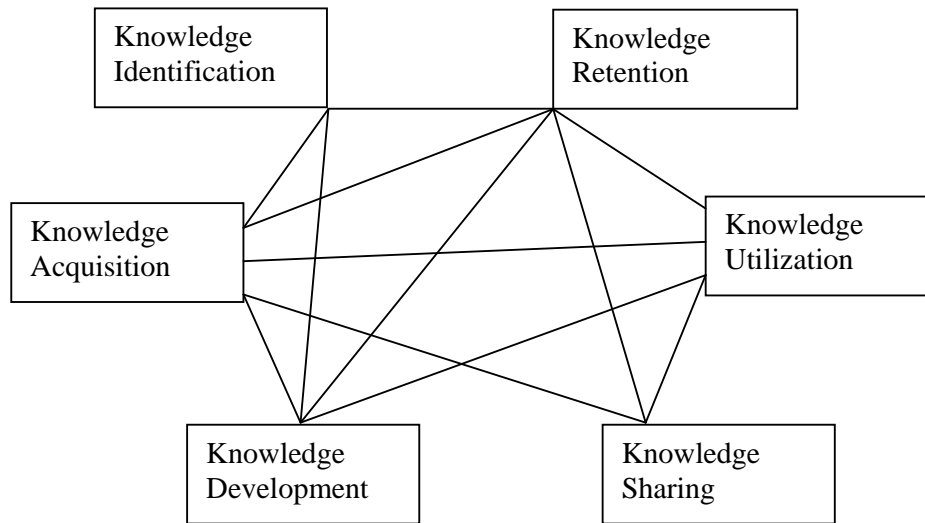
knowledge resources. Alavi and Leidner (1999) defined knowledge management as "a systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work".

Knowledge management can also be defined as the process of capturing, storing, sharing and using knowledge (Davenport and Prusak, 1998). According to Gurteen (1998), knowledge management can be defined as "an emerging set of organizational design and operational principles, processes, organizational structures, applications and technologies that helps knowledge workers dramatically leverage their creativity and ability to deliver business value". This implies that knowledge management implementation enhances the competence of employees, thus improving productivity of the organization as a whole.

The various definitions outline above indicate that knowledge management involves four main activities namely identifying, sharing, organizing and applying knowledge, that together enhance the value and provide organizations with competitive advantage (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995).

### **The process of Knowledge Management**

According to Probst *et al.* (2000), the process of KM includes knowledge identification, acquisition, retention, utilization, development and sharing (Figure 1).



Source: Probst *et al.* (2000)  
Figure1. Core Processes of KM

Knowledge identification refers to describing and evaluating knowledge in the organization. Knowledge acquisition refers to the question of what kind of intellectual capital organizations should invest in. Knowledge may be acquired from the expertise and the network the organization has with their respective stakeholders such as customers, suppliers, investors and government regulators. It is important for organizations to determine the needs and the kind of knowledge that is suitable for their organizational activities. The acquisition of knowledge may breed to innovation and sustained competitive advantage to the organizations.

Knowledge development is the procedure of synthesizing prior knowledge, ideas, information and wisdom to create new knowledge (Nonaka and Takeuchi, 1995; Probst *et al.*, 2000). Becerra-Fernandez *et al.* (2004) call knowledge development as knowledge discovery and define it as the development of new tacit or explicit knowledge from data and information. An example of how knowledge can be developed from external input in organizations is through market survey in which the target market is sampled by administering questionnaires and interviews. This way, organizations use certain mechanisms to capture the activities of their competitors in order to respond strategically and survive.

Knowledge sharing is the act of exchanging both tacit and explicit knowledge. It involves two processes i.e., socialization and exchange (Becerra-Fernandez *et al*, 2004). Socialization is interaction between individuals that allows tacit knowledge to be transferred (Nonaka, 1994). On the other hand, exchange involves the dissemination of explicit knowledge among individuals (Grant, 1996). The socialization is used to share tacit knowledge while exchange is used for sharing explicit knowledge.

Knowledge sharing is an important issue to organizations since personal experiences and skills of people can be reused to their benefit (Probst *et al*, 2000). However, some studies also indicated that people sometimes tend to hoard their knowledge in order to protect their benefits which hinder knowledge sharing (Davenport and Prusak, 1998). Socialization could be used to facilitate knowledge sharing (Nonaka and Takeuchi, 1995). Through socialization process, knowledge is being shared between individuals and among groups and become recognized.

The next core process is knowledge utilization which sometimes is referred to by other researchers as knowledge application (Becerra-Fernandez *et al*, 2004; Nonaka and Takeuchi, 1995). Utilization of knowledge is a part of knowledge management processes where knowledge is being applied. It deals with making beneficial use of the knowledge which has been discovered, captured, and shared in the organization. Two sub-processes facilitate knowledge utilization, namely direction and routine (Becerra-Fernandez *et al.*, 2004).

The last core process is knowledge retention. In the real world, employees' skills, experiences and abilities may migrate out from the firm as they retire or leave. Thus, it is highly imperative that organizations work out a plan to keep stock of these competencies. The acquired and generated knowledge needs to be captured and utilized for the benefit of the organization. Retention of knowledge normally is done through internalization and externalization (Nonaka and Takeuchi, 1995). Internalization is the conversion of explicit knowledge to tacit knowledge. On the other hand, externalization is the conversion of tacit knowledge to explicit knowledge (Nonaka and Takeuchi, 1995).

## **The benefits of knowledge management**

Knowledge management is a set of ideas and techniques, which are used for business information process and knowledge production process. In addition, it provides guidance for developing systems and technology platforms, so as to improve and enhance individual, team and organizational innovation, responsiveness and skills. In particular, the main objectives of knowledge management are as follows:

- Improve the company's ability to respond (Responsiveness).

In the era of knowledge economy, the changing market environment is multifaceted and unpredictable, there always appeared emergencies. In an effort to minimize the impact of these emergencies, organizations should solve all customers' problems with much alacrity. It requires organizations to make a rapid reaction to the market changes, and that gives the organizations the capability to withstand the pressure during emergencies.

- Improve the company's ability to innovate (Innovation).

The competitive advantage of an organization in a knowledge-based economy emanates from its ability to innovate. It is the main source to maintain the competitiveness of an organization. This requires the encouragement and motivation to explore and exploit new ideas in order to produce new products or to offer new services. Organizations must ensure that employees contribute new ideas in line with strategies to offer new products and services or to improve business processes.

- To improve the quality of staff skills (Competence).

Enhancing employee skills and knowledge level is essential for an organization to maintain its competitive advantage. This can be done through service learning, online training, life-long learning and knowledge networks. The success of knowledge management hinges upon the sufficient support for organizational and individual learning.

- Other important objectives of knowledge management are to obtain, share best practices, re-use intellectual capital, and reduce working time and iterative labor. The efficiency of knowledge management depends on a team or individual to obtain process, store and reuse the knowledge.

### **Knowledge management infrastructure**

Knowledge management infrastructure is the foundation of knowledge management. Success of an organization in employing knowledge management requires adequate infrastructure in the organization. According to Becerra-Fernandez *et al.* (2004), knowledge management infrastructure includes organizational culture, organizational structure, information technology and common knowledge.

Organization culture can be defined as the values, norms and beliefs that govern activities of organizational member (Schein, 1985). Organization culture influences how knowledge is being shared among members of an organization. Research indicates that organization culture contributes a lot to the success of knowledge management practices (Tuggle and Shaw, 2000). Organizations which do not institute the climate of knowledge management find that knowledge is not shared, discovered, captured and applied.

When organization culture supports the process of knowledge management, employees are motivated to share, and apply knowledge. For an organization to institute knowledge culture there is a need to gain management support, provide incentives and rewards to motivate employees and to implement knowledge sharing mechanisms such as face to face meetings and open discussion.

Organizational structure is the formal arrangement which governs activities of employees (Mullins, 1993). Davenport and Prusak (1998) indicate that knowledge within the organization is not only in the form of documents, but also in the norms, rules, and the hierarchical structures. Organizational structure influences knowledge management in such a way that a highly mechanistic organization will have a deficiency of knowledge sharing. In a mechanistic organization, information always moves from top to down where the lower employees don't have any platform to share their knowledge (Nonaka and Takeuchi, 1995).

This inhibits the process of knowledge management. On the other hand, in an organization with organic structure where teams, department and functions are used, individual members have the opportunity to share their knowledge.

A mechanism being currently utilized to encourage knowledge sharing is communities of practice (CoPs). A community of practice is a group of sparsely located people with diverse knowledge who regularly communicate with each other to share ideas (Lave and Wenger, 1991). CoPs depend on technologies such as video conferencing, chat rooms and teleconferencing. CoPs provide individuals with diverse experience from different environment with an opportunity to share knowledge while not in each other's proximity. Sharratt and Usoro (2003) assert that CoPs is one of the auxiliary organizational structures that enhance knowledge sharing in the organizations.

Many organizations promote knowledge sharing behavior among their employees by engaging information technology in their daily activities. Information technology is the bedrock of knowledge management. It facilitates the process of capturing, discovering, sharing and applying knowledge. According to Daft and Lengel (1986) information technology has four characteristics, which are reach, depth, richness and aggregation of the information. The reach of the information may be considered as the extent of which the information can be distributed geographically i.e., the network and the location it covered. The depth denotes the detail and amount of information that can be communicated. The depth may depend on the bandwidth used. When the bandwidth is high, then the depth and detail of the information communicated increases. The richness of information technology is referred to its ability to provide multiple types of communication at a time, rapid response, personalized messages and transfer messages in the right language. The aggregation is the ability to draw a large volume of information from different sources.

Common knowledge denotes as the long experience acquired from organizational experience. According to Grant (1996), common knowledge is based on common languages, common jargons and shared culture in organizations. Generally, common knowledge facilitates knowledge management in that knowledge is easily shared among the members since they share the same language, norms or cultures.

The physical environment of an organization also has a tremendous influence on knowledge management. The aspect of physical environment includes the design of buildings and internal settings of organizations. The environment of an organization facilitates knowledge sharing when the design is open where members find it easy to share knowledge and ideas among themselves. Davenport and Prusak (1998) for instance, reports that a water cooler can be a place where employees meet and share their knowledge.

### **Knowledge management system**

A system is comprised of integrated parts that are inter-connected to achieve a common goal. A knowledge management system is a system that assists capturing, discovering, sharing and applying knowledge using IT (Alavi and Leidner, 2001; Becerra-Fernandez *et al*, 2004). The functions of knowledge management systems include the coding and sharing of best practices, the creation of corporate knowledge directories, and the creation of knowledge networks (Alavi and Leidner, 2001).

Information technology is the foundation for knowledge management systems. Examples of information technologies that support knowledge management systems are expert systems, decision support and model-based systems, databases, group-ware, and Internet applications. These technologies support the systems in various ways. For instance, expert locator systems are used to provide information of employee's competencies and assist to pinpoint the right person who is capable of fixing certain problems. Data warehousing is used to support a variety of analyses and queries performed by middle and high-level decision makers. E-mail and electronic bulletin boards support knowledge creation to enhance the distribution and sharing of explicit knowledge. Electronic group collaboration tools are used to support teamwork, which in turn helps the employees to share their knowledge. Internet also provides a rich source of external knowledge for organizations.

### **Knowledge sharing**

Knowledge sharing has been given different definitions by various researchers. According to Lee and Al-Hawamdeh (2002), knowledge sharing is the interaction between individuals

where an opportunity is created for knowledge to be re-applied. Knowledge sharing is also defined as the process of making knowledge available to others in the organization (Ipe, 2003). At organizational level, Argote et al. (2000) denotes knowledge sharing as the process through which one unit is affected by another by knowledge.

Some researchers categorize knowledge sharing as a double sided loop. Van den Hooff and de Ridder (2004) assert that knowledge sharing is a give and take affair. Hislop (2002) also denotes knowledge sharing as an exchange of ideas or images through deliberations. According to Nonaka and Takeuchi (1995), the process of knowledge sharing leads to creation of new knowledge. This is because through sharing of individuals' thoughts and experiences new ideas may be created and added to the organizational knowledge repository.

### **Knowledge creation**

According to Nonaka and Takeuchi (1995), the interplay of tacit and explicit knowledge leads to new knowledge creation. According to Nonaka (1994), knowledge is created through the interchange of the four variables, namely socialization, externalization, combination and internalization (SECI) (Figure 2).

Socialization refers to an informal process of exchanging ideas or experiences which create tacit knowledge (Nonaka and Takeuchi, 1995). This is the act of individuals interacting or exchanging their tacit knowledge. This is basically conversion of tacit knowledge to another tacit knowledge through observation, practice, and mimicking. Socialization normally occurs in organizations through informal interactions between employees and also between employees and stakeholders such as customers, suppliers, stockholders and competitors.

Externalization refers to the transformation of tacit knowledge into an explicit, easier-to-grasp form which users would comprehend (Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). It is translation of individuals mind into an explicit form. Externalization is a formal process of explicit knowledge creation such as documenting meetings and proceedings. In the process of externalization, induction and deduction reasoning



techniques are applied to translate individual minds into understandable structures (Nonaka and Konno, 1998). In essence, externalization creates explicit knowledge.

Combination is the process of creating new explicit knowledge through the process of synthesizing, addition, sorting and grouping of existing explicit knowledge (Nonaka and Konno, 1998). Finally, internalization is the process where tacit knowledge is evolved from explicit knowledge (Nonaka, 1994; Nonaka and Konno, 1998). Internalization process becomes successful when the absorbed knowledge is operationalized in the individuals' minds. According to Nonaka and Takeuchi (1995), for organizations to be successful in creating new knowledge, they need to implement infrastructures that foster the process of knowledge creation.

All four SECI variables are important in creating new knowledge; however, socialization is considered the core aspect of knowledge creation.

	Tacit knowledge	To	Explicit knowledge
Tacit knowledge	Socialization		Externalization
From			
Explicit knowledge	Internalization		Combination

Source: Nonaka and Takeuchi (1995)

Figure 2. Four modes of knowledge conversion

## Organizational Culture

The term culture in general does not lend itself to be precisely defined. Culture is loosely defined as the set of rules, norms, values, assumptions, symbols and beliefs that govern the behavior of people. At the organizational level, culture is referred to the set of rules, norms, values, assumptions, symbols and beliefs that are shared by employees of an organization (Schein, 1985). According to Denison (1990), culture of an organization forms the basis of its organizational management system, principles, practices and expected behavior.

The above definition indicates the role of organizational culture in setting the rules for behavior patterns, interaction, and policies and procedures which employees follow in striving to achieve the common objectives of the organization. Scholars have proposed several dimensions of organizational culture pertaining to organizational climate, style of leadership, rewards and structure (Liebowitz and Chen, 2001).

In account, culture is an invisible hand that directs the activities and behavior of individuals in organizations. According to Alavi and Leidner (2001), organizational culture can act as a propeller or an obstacle for knowledge sharing and creation. Culture sets the norms, rules, standards and expectations which shape the behavior and insight of employees on how to share their knowledge (De Long, 1997).

There are many ways organization can inculcate a knowledge-sharing culture. A study conducted on companies that were known to have a corporate culture that support knowledge sharing by the American Productivity and Quality Center (APQC) found six key areas that facilitate and nurture environments conducive to knowledge-sharing: the relationship between knowledge sharing and business strategy, the role of human networks, the role of leaders and managers, the fit with the overall culture, the relationship between knowledge-sharing and daily work, and the institutionalizing of learning disciplines (McDermott and O'Dell, 2001).

A study conducted at Queen's University in Ontario found that immediate supervisors play a significant role in instilling a knowledge sharing culture. The study found that individuals are far more likely to view knowledge sharing as important if their immediate supervisor advocates knowledge sharing behavior (Seeley, 2002). Newman (2000) suggests conditions that need to exist in an organization in order for knowledge sharing to occur. The conditions are an individual that provides the knowledge should feel recognized and respected and he or she is credited in the future.

Organizational culture has been examined quite extensively by researchers. Many studies have supported the importance of organizational culture in influencing organizations' activities and work practices. Drawing from this line of evidences, we also posit the influence of organizational culture on knowledge management. In particular, we postulate

that organizations' ability to share or create new knowledge depends on whether there is a culture of innovation orientation and team orientation in the organizations.

According to Popadiuk and Choo (2006), innovation is the "generation of new idea and its implementation into a new product, process or service, leading to the dynamic growth of the national economy and the increase of employment as well as to a creation of pure profit for innovative business enterprise". Innovation is classified into radical innovation, incremental innovation, technological innovation and market innovation (Chandy and Tellis, 1998; Abernathy and Clark, 1985).

According to Nambisan (2002), innovative orientation can be defined as an attitude and insight of employees that contribute to the process of producing goods and services. Nambisan (2002) classified innovative orientation into two: individuals' orientation and organizational orientation. Individual orientation to innovation is defined as an attitude and insight of individual employees that prompt them to contribute their ideas to produce innovative products. An organizational orientation is the behavior and insight of top management that complement to the production of innovative product through the process of knowledge sharing and collaboration (Nambisan, 2002). In an organization where top management classify innovation as top priority, employees perceptions and attitude tend to be poised towards the contribution of their knowledge and experience to develop innovative product.

Normally in an organization with an innovative culture, employees tend to be highly responsible because there is a higher level of autonomy and empowerment through risk taking. According to Burns and Stalker (1994), a highly innovative organizational environment has a less rigid organizational structure with a less formalized rules and relationships. An organization that has less formalized rules with a cooperative relationship where risk taking is high, has a tendency to produce innovative products since employees are free to share their knowledge and mistakes do not result to punishment.

Harris and Harris (1996) defined team as a workgroup or unit with a common objectives and developing mutual relationship in achieving the goals. Teamwork promotes employees to share experience, capabilities, knowledge and competencies to execute the day-to-day

functions. Through sharing activities, new knowledge could be created. Nonaka (1994) posits that sharing of individuals' knowledge is the beginning of the creation of new knowledge.

Team orientation is another dimension of organizational culture. Team orientation refers to the level of which task execution within an organization are assigned to groups rather than individuals. A team oriented organizations encourages their employees to use all the available resources including knowledge and experience to solve the task at hand. According to Nonaka (1994), tacit knowledge is enthralled through collaborative activities.

The usage of teams in work settings depends on the culture of an organization. Some organizations may not consider teamwork as its main work pattern. However, most management gurus will suggest the use of teams in organizations. The benefits of using team such as knowledge and experience sharing in the context of knowledge management are tremendous. In a team oriented organization, employees could be motivated with the culture of respecting individuals' knowledge contribution and this leads them to contribute further to the organization.

### **Previous studies**

Hoegl and Schulze (2005) conducted a study investigating the usage of ten knowledge management methods, namely informal events, experience workshops, communities of practice, project briefings, expert interviews, best practices cases, knowledge broker, experience reports, data bases and research services to support knowledge creation in new product development (NPD) projects. 376 questionnaires were distributed to members of 94 NPD projects in 33 companies in Germany, Austria, and Switzerland. Building on qualitative evidence and case examples from the participating companies, the researchers described how the ten knowledge management methods affect knowledge creation in NPD projects. They suggested that the ten methods have the potential to support knowledge creation and described their effect on different modes of knowledge creation (i.e., socialization, externalization, combination and internalization).

Using a case study of a leading multinational IT consulting firm, Sherif and Xing (2006) examined complex adaptive systems (CAS) and the process of knowledge creation. From the case study, they found that the processes used by CAS can be mechanisms that organization can use to facilitate knowledge creation process. The processes are identifying attributes of each knowledge assets, drawing relationships between them, and allowing their abstraction and recombination. They also found that knowledge repository may stifle innovation as employees may fail to identify the need for change and update the existing knowledge.

Allameh et al. (2011a) conducted a correlational study using Isfahan University as a case study, investigating the relationship between organizational culture and knowledge management. One hundred and nine questionnaires were distributed randomly to staff at the university. In their study, four cultural types were examined namely group, developmental, hierarchical and market culture. The six knowledge management processes evaluated were knowledge creation, capture, organization, storage, dissemination and application. The results of the study showed that there are significant relationship between organizational culture and all aspects of knowledge management processes.

In another study, Allameh et al. (2011b) investigating the influence of knowledge enablers namely technology, culture and structure on knowledge management processes. Questionnaires were distributed to 156 personnel and managers of Isfahan Refinery Company in Iran. The multiple regressions analysis showed that technology and culture have significant effects on knowledge management processes while, the relationship between structure and knowledge management processes was found to be not significant.

Jiacheng et al. (2010) explored intra-organizational knowledge sharing motivations in cross-culture context. In this study, they postulated that intrinsic and extrinsic motivation mechanisms i.e., internalization, identification and compliance have significant effect on the attitude to share knowledge among Chinese and American employees. Twenty organizations (ten in the U.S.A and ten in China) were invited to participate in the study. The targeted subjects were employees in R&D teams or R&D centers. Through online survey, they received 149 responses and 131 responses from China and the USA respectively. The results of the study supported the hypotheses that national cultural values have significant influence on the intrinsic and extrinsic motivation mechanism. Specifically,

the results showed that American employees perceive a stronger feeling on internalization than Chinese employees; Chinese employees perceive a stronger feeling on identification than American employees; and Chinese employees perceive a stronger positive association between conformity and the attitude than American employees. Interestingly, the study also found that Chinese tend to conform to groups' opinion and favor knowledge sharing as a means of achieving harmonious relationship. On the other hand, due to individualistic nature of the American, they engage in knowledge sharing to show their self-worth.

Using enterprise resource planning system's (ERP) implementation as a target activity, Jones et al. (2006) examined eight dimensions of culture that may affect knowledge sharing. The cultural dimensions investigated are orientation to change; control, coordination and responsibility; orientation to collaboration; basis of truth and rationality; motivation; orientation to work; orientation and focus; and nature of time horizon. A multi-site case study of four firms in the petroleum industry that had implemented SAP was used in this study. Based on the analysis on the differences and similarities of the four firms, the researchers come up with the configuration of cultural dimensions that best facilitate knowledge sharing. The study found the two dimensions that exhibited the most on knowledge sharing are orientation to change and the basis of truth and rationality. The results of the study also indicated that each cultural dimension must be supportive to the others before a conducive knowledge sharing environment exists.

Drawing from social interaction perspectives, Chen and Huang (2007) conducted a study on the influence of organizational climate and structure on knowledge management. The study was conducted in Taiwan. Based on 146 valid questionnaires, the regression analysis indicated that innovative and cooperative climate positively related to social interaction. The study also found that social interaction has positive effects on trust, communication and coordination, and these three factors consequently affect knowledge management. The study also found that social interaction is positively related to knowledge management and the social interaction mediates the relationship between organizational climate and organizational structure to knowledge management.

Porumbeanu (2010) conducted an exploratory study assessing organizational conditions for the implementation of knowledge management at Romanian academic libraries. Five large

academic libraries in Romania were chosen as samples for the study, three from Bucharest, one from Moldavia and one from Banat. Eighty questionnaires were randomly distributed to the library staff in these libraries. The results of the study showed that in terms of managerial style, 38% of the respondents characterize their organization as a stimulating climate, 27% as authoritative and 18% as random. On the work environment, 21% of the respondents think that their work environment will encourage the development of communities of practice and organizational learning, 11% knowledge sharing, 9% communication and 5% teamwork. The results also indicated that 89% of the respondents are willing to share their knowledge and professional experience, which the reasons of teamwork, exchange of experience, professional co-operation, increase of efficiency and stimulation of communication. Based on the results of the study, Porumbeanu (2010) felt that the likelihood of success of the implementation of knowledge management in the institutions understudied is high.

Michailova and Minbaeva (2011) conducted a study investigating the link between organizational culture, specifically organizational values and knowledge sharing. Empirical data were collected through content analysis and a questionnaire-based survey among 219 managers and employees of Danisco, a Danish multinational company. Based on the analysis of the data, they concluded that knowledge sharing behavior in Danisco is not influenced by organizational values per se but by the degree of the values being internalized by the organizational members. They found that espousing, enacting and internalizing the value of dialogue as a core Danisco's organizational value facilitates knowledge sharing among members of the organization.

Chen and Lin (2004) investigated the effects of environment, knowledge attribute, organizational climate and firm characteristics on knowledge sourcing decisions. Drawing from Nonaka's (1991) work, they postulated that organizational climate i.e., intention, autonomy and requisite variety is likely to affect the choice of knowledge source. Based on the logistic regression on 125 valid and complete questionnaires sent to 750 Taiwanese firms listed in the China Credit Information Service Incorporation, they found that all the three organizational climate factors above have significant effects on the choice of knowledge sourcing. Their study suggests that firms are more likely to choose internal knowledge development when they are high in intention, autonomy and requisite variety.

In a related study, Janz and Prasarnphanich (2003) conducted a study investigating the linkage between organizational and individual characteristics and knowledge-related activities in cooperative learning groups and the work outcomes. The data was collected from 203 information systems professionals from 13 organizations in the United States and Canada. The study found that the relationship between autonomy and cooperative learning and the relationship between organizational climate and cooperative were significant. The study also found that the relationship of cooperative learning on work satisfaction and performance was significant. Pertaining to the current study, the results of the study on organizational climate suggest that to enhance cooperative learning, organizations need to provide low risk, positive reward, warmth and supportive environment to organizational members.

Sveiby and Simons (2002) conducted a study on collaborative climate. Although the study did not empirically test the link between collaborative climate to knowledge sharing, they make an assertion that collaborative climate have positive influences on knowledge creation and sharing. The online survey received 8277 responses from public and private employees from Australia, North American/Canadian and Asia Pacific and Scandinavian countries. Interesting findings of the study include collaborative climate tends to improve with age, education level and managerial role. Collaborative climate tends to be better in private firms and peak with mid-size firm level. In terms of appreciation of collaborative climate, the results showed that employees tend to experience a U-formed appreciation.

Tsai (2002) investigated the influence of organizational structure in the aspect of coordination mechanisms on intra-organizational knowledge sharing. The data collection was conducted in a large multiunit company using questionnaire surveys. Results of the study showed that centralization, one form of formal hierarchical structure has a significant negative effect on knowledge sharing; however, social interaction through informal lateral relations has a significant positive effect on knowledge sharing among units that compete with each other for market share. However, these relationships do not hold in the situation where units compete with each other for internal resources.

In summary, previous studies as presented in this section indicate the importance and influence of culture on knowledge sharing and creation. While most of these studies



provide the link of the relationships, specific studies that link organizational culture namely innovative and team orientation and knowledge sharing and creation are still underdeveloped to nonexistence. Thus, the study on this is considered timely and needed.

### **Hypothesis Development**

According to Popadiuk and Choo (2006) innovation is the “generation of new idea and its implementation into a new product, process or service, leading to the dynamic growth of the national economy and the increase of employment as well as to a creation of pure profit for innovative business enterprise”. Innovation is the act of a firm adding value to its existing products or services. The culture of an organization has a tremendous influence on the ability of its employees to contribute innovative ideas for the production of new products or services.

According to Nambisan (2002), innovative orientation reflects attitude and insight of employees that may contribute to a new process of producing goods and services. The culture of an organization affects the perception and the attitude of employees which motivate them to improve upon the process of producing goods and services with may lead to commercialization. The new processes or products may be the results of knowledge creation and sharing. As mentioned previously, organizational culture plays a significant role in setting up a positive environment for knowledge creation and sharing. In the twilight, managements may use a long term procedural plan with supports and recognition programs to instill this culture in the organization.

Many researchers have suggested and posited that organizations’ ability to create, share and learn new knowledge is the most important factor that organizations need to enhance their innovation capabilities (Popadiuk and Choo, 2006). Nonaka (1994) supports this by stating that the ability of an organization to innovate leans on their capacity to manipulate the ideas or knowledge of its individual employees. Nonaka (1994) posits that organizations would not be able to create new knowledge without the involvement of individuals; however, organizations can provide the necessary platforms for individuals to create

knowledge. This exemplifies the important of building organizational culture, specifically innovative culture that enhance the process of creating and sharing knowledge.

One of the important components of an innovative organizational culture is the degree of risk taking and mistakes tolerance given to employees, which encourage knowledge creation and sharing. It has been suggested that the level of risk taken and mistake tolerance culture in an organization influences knowledge creation and sharing. The culture augments employees to share their tacit knowledge, explore new ideas and indirectly, cultivate the zeal to innovate. An innovative-oriented organizational culture provides environments for creating and sharing knowledge irrespective whether it is explicit or tacit. Nonaka and Takeuchi (1995) propounded that the interplay of individuals' knowledge leads to the process of creating new knowledge. In an innovative-oriented organization, the employees tend to investigate into new ways of productions of products or services by sharing their past experience, ideas and knowledge. By cultivating this culture, an organization improves the perception and attitude of employees which empower them to fully utilize their competence to create and share knowledge, which tantamount to innovation and creativity.

Previous researchers such as Caloghirou, Kastelli and Tsakanikas (2004) argue that the act of implementing, supporting and directing an organization towards knowledge sharing is essential to the organization's performance. According to Tsai (2001), innovation orientation culture provides platforms for knowledge access and learning. In their study, MacCurtains et al. (2009) found a positive relationship between innovation and knowledge sharing.

Based on the literatures above the first and the second hypothesis are proposed.

Hypothesis 1: Innovation orientation has a significant positive influence on tacit knowledge creation.

Hypothesis 2: Innovation orientation has a significant positive influence on tacit knowledge sharing.

## **Team Orientation**

In the context of knowledge management, team can be referred to as a collection of individuals who share interrelated knowledge and ideas for a common goal. Team orientation is the act of shaping the attitude and the perception of individuals to work as a group to execute a common goal. There can be team within multiple teams. Team orientation in an organization can lead to the creation and sharing of tacit and explicit knowledge. Working in team allows members in the cause of solving a given task interact with each other. Interacting with others in a team may lead to sharing solutions and creating new knowledge for solving the problem at hand.

According to Nonaka and Takeuchi (1995), the ability of an organization to create new knowledge depends on the way works are performed in the organization. They illustrated the effect of work-formation on knowledge creation and sharing. In Japanese manufacturing firms, due to their emphasis on workgroups, knowledge get created and shared through socialization process. Unlike western organizations, which are more individual-based in terms of interest and effort, knowledge gets created through externalization process.

As team may constitute individuals with diverse knowledge and experience, allowing them to interact to exchange their knowledge and experience especially when executing a given task may lead to new knowledge creation. Granovetter (1973) argued that segregation of employees may result in lost opportunity to an organization to create new knowledge.

Leaders play an important role in encouraging knowledge sharing. Within the mechanism of teamwork, leaders are considered a role model and can be considered to be highly competent. They are expected to share knowledge and experience and these may influence their team members to do the same thing (Fong et al., 2007). New knowledge is sometimes being created when there is an interaction between multidiscipline teams (Fong et al., 2007). Members from different background interact with each other to exchange and share their knowledge. Due to diverse background and discipline, the chances that new tacit knowledge to be created will increase.

In addition, as every team has a collective goal to be achieved, it is imperative for them to make collective decisions. The act of achieving a collective decision has a positive effect on knowledge sharing and creation. For instance, in an effort to work towards attaining their goals especially a team which is highly geared towards achieving team-goal, they may deliberately exchange their knowledge, experience and competences in achieving the set goals. This is termed as decision comprehensiveness (Simons et al., 1999). The interactions of this knowledge, experience and competence are tantamount to creating new knowledge.

Looking at the model of Nonaka and Takeuchi (1995) it is ascertain that socialization is the most important element in the process of creating and sharing individuals' tacit knowledge. Socialization is considered one important means that individuals share their tacit knowledge with another. We posits that in a highly team oriented organizations, employees form groups to execute tasks where they constantly share their ideas, experience and knowledge. According to O'Reilly et al. (1991), team orientation organization inculcates collaboration, collective decision making and group orientation in their organizational culture platform. This leads to the formulation of the third and fourth hypothesis.

Hypothesis 3: Team orientation has a significant positive influence on tacit knowledge creation.

Hypothesis 4: Team orientation has a significant positive influence on tacit knowledge sharing.

Figure 3 below shows the research model of this study. The four hypotheses proposed in this study are as shown in the model.

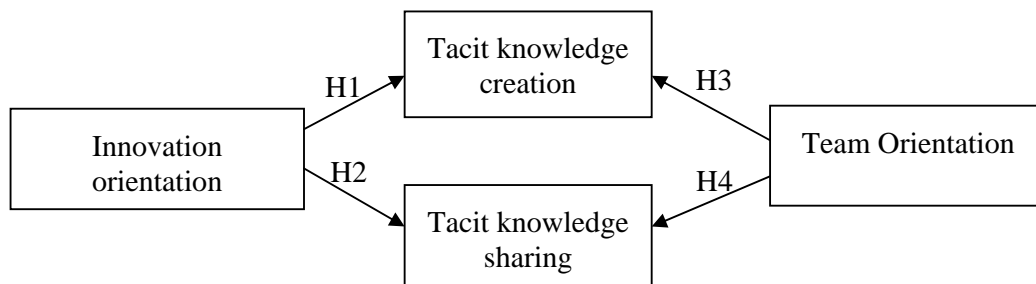


Figure 3. The Research Model

## **Chapter 3**

### **Research Methodology**

#### **Introduction**

To address the research objectives and test the proposed research model, a survey approach was taken. A survey questionnaire was prepared to solicit respondents' perception on the four constructs pertaining to the research, namely tacit knowledge creation, tacit knowledge sharing, team orientation and innovation orientation. The questionnaire items were either borrowed from previous relevant literature or devised using available models. Three hundred and twenty seven questionnaires were mailed to manufacturing firms in the state of Johor in Malaysia that are listed in the Federation of Manufacturers directory. The usable returned questionnaires, comprising 18% of the total, were then analyzed to examine the propositions.

#### **Questionnaire items**

It was felt that to correctly measure the constructs through the survey, each construct needed to be mined by at least three questions. Although some of these questions might have been redundant in nature, but to the researchers, this fact does not seem to cause any harm to the outcomes. The final 18 items to measure all the constructs for this study were develop and included in the printed and mailed questionnaires. All the items were in the form of 5-point Likert scale and the average of scores of items for each construct was taken as the overall value for that construct.

#### **Construction of items for tacit knowledge sharing**

There were a total of four questions bound for tacit knowledge sharing. The first and fourth questions were adapted from a research report by Lin (2007) titled "To Share or Not to

Share: Modeling Tacit Knowledge Sharing, Its Mediators and Antecedents". The first item attempts to elicit frequency of tacit knowledge sharing in incidents involving sharing work experiences. The item is as demonstrated below:

Item 1: "In our department, we always share our work experience among co-workers."

The fourth item builds on sharing of ideas in order to solve problems at work. The item appears in the questionnaire as:

Item 4: "In our department, we always share our ideas on solving work related problems among co-workers."

The second and third items we adapted from Yang and Farn (2009) which in turn has been adapted them from Bock *et al.* (2005). These items probe for sharing of work know-how and expertise as instances of tacit knowledge sharing. These items are shown below:

Item 2: "In our department, we always share our work know-how among co-workers."

Item 3: "In our department, we always share our work expertise among co-workers."

### **Construction of items for tacit knowledge creation**

Tacit knowledge creation was the construct that we found the least previous works on. To explore this construct, five items were devised using definition of tacit knowledge and SECI model by Nonaka and Takeuchi (1995). According to this model, knowledge creation and transformation follows a four stage cycle. The stages are socialization, externalization, combination and internalization. During these stages, knowledge is transformed from tacit to explicit and vice versa. Pertinent to this study, are socialization and internalization in which tacit knowledge can be created. The five items used to elicit tacit knowledge sharing situation were as follows:

Item 5: “In our department, we apply our new learning to our current know-how to solve new problems.”

Item 6: “In our department, through discussion, we combine the current knowledge/experiences to create new ways of solving problems.”

Item 7: “In our department, we utilize our previous experiences to come out with a new solution.”

Item 8: “In our department, we apply guidelines and booklets that we read to our everyday working situations.”

Item 9: “In our department, the way we perform tasks are emerged from employees’ experiences.”

#### **Construction of items for team orientation**

To measure team orientation, we devised three items and adapted a fourth item from Core Leadership Competencies Self-Assessment Questionnaire by public service commission, Nova Scotia, Canada. These items aim at performing job tasks, making decision, problem solving and supporting collective decision in teams. The items number 10 to 12 are devised by the researchers and number 13 adapted from the source just mentioned.

Item 10: “In our department, work is performed in teams.”

Item 11: “In our department, we make decisions in teams.”

Item 12: “In our department, we solve problems collaboratively.”

Item 13: “In our department, we support team decisions.”

#### **Construction of items for innovation orientation**

Looking for literature on innovation orientation, we found quite a number of previous works on the matter. However, most of these works focused primarily on product or

process innovations and very little work was found on innovation orientation with possible effects on knowledge management related issues. As to the researchers, knowledge creation could have been effected by innovation orientation in the form of an innovation-friendly atmosphere and an organizational structure that would encourage different viewpoints and practices. Five questionnaire items were developed based on these concepts to explore these properties in the cultures of the respondent organizations.

Item 14: "In our department, failures are treated as learning processes".

Item 15: "In our department, doing things in new ways are acceptable".

Item 16: "In our department, employees are not threatened of taking risks."

Item 17: "In our department, employees are not prevented from giving new ideas."

Item 18: "In our department, employees with new ideas and innovative solutions are encouraged."

## **Respondents**

The respondents for this study were engineers or technicians with more than three years of organizational tenure. The reason for choosing engineers or technicians was the fact that they were the ones that could most correctly be considered a knowledge worker. The logic behind the experience requirement was to make sure the respondent has enough familiarity with organizational culture to provide true answers to the questions.

The manufacturing firms were looked for their information and contact details in the directory of Federation of Malaysian Manufacturers (FMM) 2009. The questionnaires were mailed to the human resource (HR) departments of the companies and asked them to pass the questionnaire over to one of their engineers or technicians with at least three years of experience with the organization. To provide an easy return of the completed questionnaires, a prepaid envelop was also included with each questionnaire. A total number of 327 manufacturing firms were recognized and were sent the questionnaire.



## **Analysis methods**

Having waited till the responses ceased to continue being delivered and having received sufficient number of complete questionnaires, we began to analyze the responses. There were four or five items for each construct and the mean value of responses for each construct was taken as that firm's response to that construct. Once all returned questionnaire were projected into a database, data analysis was performed. The analysis included four stages: correlations and regressions.

## **Validity and reliability test**

Factor analysis using principle components with varimax rotation was performed to evaluate the validity of the items used to measure all the constructs in this study. To examine the reliability of the construct measurement, we conducted Cronbach's alpha analysis.

## **Correlations**

Considering the research model, four correlations were conducted between the constructs using Pearson correlation analysis. The test was conducted in order to explore the correlations between team orientation and tacit knowledge sharing, team orientation and tacit knowledge creation, innovation orientation and tacit knowledge sharing and finally between innovation orientation and tacit knowledge creation. The software used to conduct these tests was SPSS v.17 for Windows.

## **Regressions**

The next stage to verify the research model was to perform two multiple regression analyses on the constructs to explore the relationship between the variables in the model. The first test was on team orientation and innovation orientation as the independent variables versus tacit knowledge sharing as the dependent variable. The second regression

test would have been on the same independent variables having tacit knowledge creation as the dependent variable. These tests were also conducted using SPSS v.17 for Windows.

## Chapter 4

### Data analysis

#### Descriptive analysis

To get the required information on manufacturing firms in Johor, the 40<sup>th</sup> yearbook of Malaysian Industries Directory, published in 2009 (FMM09) was used. A total of 327 firms were chosen on the basis of having manufacturing operations in Johor. Questionnaires were then mailed to human resource department of these firms accompanied by a note asking the HR department to have the questionnaire filled out by an engineer or a technician of high tenure. Further contacts were also made and 59 usable filled questionnaires were returned. Statistical Packages for Social Science (SPSS) was used to analyze the data. Table 1 summarizes the respondent firms' profiles. It is also notable that the questionnaires were filled out by engineers or technicians with over 8 years of tenure on average.

Table 1. Respondent firms' profiles

Variable	Category	Frequency	Percentage
Years of operation	Less than 5 years	4	6.78
	5 to 10 years	6	10.17
	11 to 15 years	6	10.17
	More than 15 years	43	72.88
Ownership	Local	19	32.20
	Foreign	31	52.54
	Joint equity	9	15.26
Number of employees	Less than 5	4	6.78
	5 to 10	6	10.17
	11 to 15	6	10.17
	More than 15	43	72.88

### Factor analysis and construct verification

Factor analysis method was performed to evaluate the validity of the constructs. The results showed that 5 of the questionnaire items, namely questions numbered 4, 5, 8, 13 and 18 did not load well on their respective construct and consequently were dropped. Remaining were 13 items which all loaded well on their construct. Table 3 shows the output of the factor analysis for the remaining items using principle components with varimax rotation. As shown in Table 4, Kaiser-Meyer-Olkin (KMO) measure for the constructs was satisfactory (greater than 0.5) and Bartlett's test of sphericity was also significant. Cronbach's Alpha was also measured for each construct to test the reliability of construct measurements by their respective items and all were above 0.6, therefore is considered reliable (Hair *et al.*, 1998) (Table 2).

Table 2. Reliability Results

Construct	No. of Items	Cronbach's Alpha
Team Orientation	3	0.853
Innovation Orientation	4	0.786
Tacit Knowledge Sharing	3	0.893
Tacit Knowledge Creation	3	0.753

Table 3. Rotated Component Matrix

Items	F1	F2	F3	F4
TO10	0.769			
TO11	0.879			
TO12	0.892			
IO14		0.741		
IO15		0.804		
IO17		0.725		
IO18		0.732		
TKS1			0.866	
TKS2			0.919	
TKS3			0.867	
TKC6				0.789
TKC7				0.768
TKC9				0.840

Table 4. Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

KMO Measure	0.752
Bartlett's Test Significance	0.000

### Correlation analysis

To look for the correlations among the variables, a set of Pearson correlation analyses were conducted. According to Weinberg and Abramovitz (2002), the Pearson correlation values (r) of 0.5 and greater signify a strong correlation, while correlations with an r greater than 0.3 considered moderate and lower than that treated as weak correlations. The correlations results are summarized in Table 4 below.

Table 5. Correlation analysis results

No.	Variables involved	P-value	Pearson Correlation r	N
1	TO-TKS	0.000	0.573	59
2	IO-TKS	0.003	0.379	59
3	TO-TKC	0.000	0.619	59
4	IO-TKC	0.019	0.305	59

As demonstrated in the table above, the correlations between team orientation and tacit knowledge sharing and between team orientation and tacit knowledge creation are significant and strong. On the other hand, the correlations pertaining to innovation orientation, namely those with tacit knowledge sharing and tacit knowledge creation are dimly moderate though significant.

So far, the impression of the correlation analysis results is that team orientation has a stronger correlation with both tacit knowledge sharing and creation as compared to the relationship between innovation orientation and tacit knowledge sharing and creation. The discussion of whether this continues to be the case comes next.

## Regression analysis

Two multiple regression analyses were performed to test the hypothesized model, the first to test the first and the third hypotheses while the second to examine the second and fourth ones. According to Cooper & Schindler (2003), the variance inflation factor (VIF) of more than 10 is a sign of multicollinearity in regression analysis. As can be seen in Tables 5 and 6, VIFs obtained in the analyses did not show signs of multicollinearity.

Table 6. Regression analysis, Tacit Knowledge Creation

Multiple $R = 0.619$ $R$ square = 0.383 Adjusted $R$ square = 0.361 Standard error = 0.51483				
Variable	Beta	$t$	Sig.	VIF
Team Orientation	0.628	5.132	0.000	1.358
Innovation Orientation	-0.18	-1.44	0.886	1.358

Table 7. Regression analysis, Tacit Knowledge Sharing

Multiple $R = 0.582$ $R$ square = 0.338 Adjusted $R$ square = 0.315 Standard error = 0.53324				
Variable	Beta	$t$	Sig.	VIF
Team Orientation	0.514	4.061	0.000	1.358
Innovation Orientation	0.115	0.905	0.369	1.358

As Tables 5 and 6 show, multiple regression results support only two of the four initial hypotheses of this study. While the analyses came to support the proposition that team orientation is a good predictor of tacit knowledge creation and tacit knowledge sharing, it failed to show such properties for innovation orientation. Therefore, out of the initial four hypotheses, only the third and the fourth were supported. On the other side, there were insufficient evidence to support the first and the second hypotheses.

Such findings enable us to come out with the final model as shown in Figure 4 below.

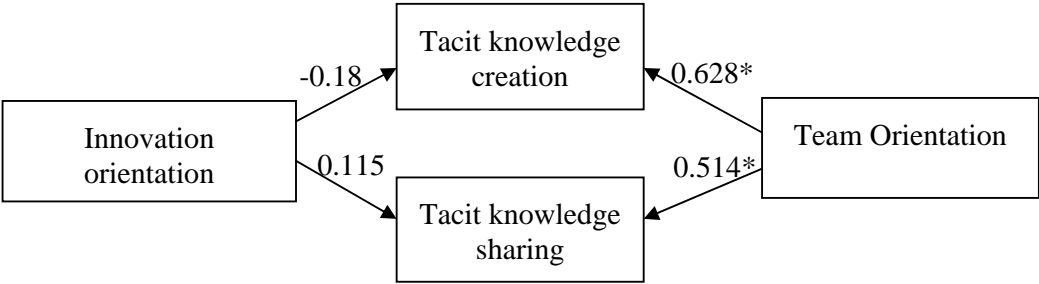


Figure 4. The Final Research Model

## **Chapter 5**

### **Findings and Discussion**

#### **Introduction**

This study investigates the relationship between organizational cultural dimensions i.e., team orientation and innovation orientation and tacit knowledge creation and sharing. A research model has been developed based on previous literatures to link the two cultural dimensions to the two knowledge management processes as mentioned above. This chapter provides summary of the findings, conclusions, and recommendations of the study.

#### **Findings and Discussion**

In this study, four hypotheses were developed. They are:

Hypothesis 1: Innovation orientation has a significant positive influence on tacit knowledge creation.

Hypothesis 2: Innovation orientation has a significant positive influence on tacit knowledge sharing.

Hypothesis 3: Team orientation has a significant positive influence on tacit knowledge creation.

Hypothesis 4: Team orientation has a significant positive influence on tacit knowledge sharing.

Multiple regression was conducted to test the hypotheses stated above. The level of significance was specified at 0.05. Table 7 presents the summary of the regression results.



Table 8. Regression results for innovation and team orientation and knowledge sharing and creation.

Variable	Beta	Sig.
Innovation Orientation --> Tacit Knowledge Creation	-0.18	0.886
Innovation Orientation --> Tacit Knowledge Sharing	0.115	0.369
Team Orientation --> Tacit Knowledge Creation	0.628	0.000
Team Orientation --> Tacit Knowledge Sharing	0.514	0.000

*Hypothesis 1: Innovation orientation has a significant positive influence on tacit knowledge creation.*

Innovation orientation in this study refers to an innovation-friendly atmosphere provided by organizations that encourages different viewpoints and practices, in addition to encouraging learning and risk taking in employees' daily work. Interestingly the hypothesis that innovation orientation has an influence on tacit knowledge creation was not supported in this study.

*Hypothesis 2: Innovation orientation has a significant positive influence on tacit knowledge sharing.*

Like hypothesis 1, the relationship as postulated in this study between innovation orientation and tacit knowledge sharing was also not supported. This is quite surprising given the fact that innovation orientation culture provides open atmosphere that should encourage knowledge sharing.

*Hypothesis 3: Team orientation has a significant positive influence on tacit knowledge creation.*

As expected, our hypothesis that team orientation has a positive influence on tacit knowledge creation is supported. In this study, team orientation refers to the degree of collectivism in employees' decision making, problem solving and performing job-related tasks. The results are expected as when tasks are performed in teams, they encourage socialization. Socialization allows exchange of ideas, which may lead to combination of ideas, which consequently creation of new ideas (Nonaka and Takeuchi, 1995).

*Hypothesis 4: Team orientation has a significant positive influence on tacit knowledge sharing.*

The results of the study also support the hypothesis that team orientation has a significant influence on tacit knowledge sharing. Work in team inspires members to exchange ideas and experience with each other. Working and solving problems together provide opportunities for all members to learn from each other. As they learn from each other, the internalization of knowledge may result. Table 8 provides the summary of the hypothesis results.

Table 9. Summary of the Hypothesis Results

<b>Hypotheses</b>	<b>Results</b>
Innovation orientation has a significant positive influence on tacit knowledge creation.	Not supported
Innovation orientation has a significant positive influence on tacit knowledge sharing.	Not supported
Team orientation has a significant positive influence on tacit knowledge creation.	Supported
Team orientation has a significant positive influence on tacit knowledge sharing.	Supported

### **Contribution to Academic Research**

This study has several contributions to knowledge management research. Although, not all the hypotheses in this study were supported, the two supported hypotheses i.e., team orientation has significant influence on tacit knowledge creation and team orientation has significant influence on tacit knowledge sharing, highlight the link between organizational culture and knowledge management.

Second, as highlighted in the problem statement section, there are limited studies, which empirically investigating specific dimensions of organizational culture on tacit knowledge creation and sharing. Therefore, this study extends the existing empirical studies related to organizational culture effects on knowledge management, specifically knowledge creation and sharing.

Third, the results of this study show that team orientation has a positive effect on tacit knowledge creation and sharing. The results provide empirical support to many of researchers' claims that organizational culture affects knowledge management. Finally, the results of this study extend the support of the importance of organizational culture and human factors in managing knowledge. Many researchers claim that knowledge management is eighty percent organizational culture and human factors and twenty percent technology. The results may support the beliefs that organizational success in knowledge management could substantially contributed by the ability of organizations to manage their human factors and culture.

### **Contribution to Practice**

This study also has several practical contributions. First, in this study, team orientation has emerged as an important predictor to tacit knowledge creation and sharing. The results indicate that employees share their knowledge when working in teams. Therefore, in an effort to make individual employees to share their knowledge, organizations should make teamwork as their main organizational structure. Working in team provides opportunities for employees to socialize and interact. It is known that transferring of knowledge is expected to take place in this setting. Organizations may also want to introduce activities or initiatives that enhance team' *esprit de corps* such as sense of belonging of the group to further enhance the positive contribution of the team. The sense of belonging may motivate members further to share knowledge. The sense of belonging can be initiated by implementing collaborating cultures like team briefing, reviewing analyses of past and future issues together and others.

Second, the results show that team orientation has a positive influence on tacit knowledge creation. This implies that new knowledge could be created when individuals work in team. The advantage of using team in work setting is that it provides platforms for various ideas and experience to be considered in problem solving. In addition, the compositions of team members may further improve the quality of perspectives that are being shared. The act of sharing their knowledge, experience and ideas may lead to the creation of new knowledge.

Therefore, organizations may need to consider using team and encouraging collectivism in employees' decision making, problem solving and performing job-related tasks.

### **Recommendation for future Research**

Respondents of this study were engineers or technicians in manufacturing firms in Johor, Malaysia. Even though the scope of the population was wide, only 18% i.e., 59 out of 327 questionnaires distributed were usable and analyzed in this study. This may affect the analysis of the data and generalization of the results. The limitation of using mailed questionnaire as shown in this study is the poor respond from the respondents. Therefore, it is recommended that future research may want to consider using other means of data collection to increase the returned rate.

The scope of this study also provides opportunity for future research. This study was conducted among manufacturing companies in Johor as its respondents. This may limit the generalization of the data. Extending the scope of the study to include all manufacturing companies in Malaysia may enhance the generalization of the findings.

The study only investigated two organizational cultural dimensions i.e., team orientation and innovation orientation. Future studies may want to include other organizational cultural dimensions in their studies. These enhance the comprehensiveness of the organizational cultural dimensions covered.

### **Conclusion**

In conclusion, the results of this study have established the link between team oriented culture to tacit knowledge creation and sharing. This is an initial study and a very limited organizational culture dimensions were investigated. Although not all the hypotheses were supported, the study provides a preliminary link between organizational culture and knowledge management. Further researches utilizing more organizational cultural dimensions are recommended to get a comprehensive view on the effect of organizational culture on knowledge management.

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